

(57) **Abstract:** While a plastic optical fiber (POF) strand (11) is guided by guide pulleys (21-28) toward a winding machine (17), an internal defect in the POF strand (11) is detected by a defect detection apparatus (20). The defect detection apparatus (20) comprises three light illumination devices (31-33), line sensor cameras (35-37) and processing units (41-43). The light illumination devices (31-33) illuminate the POF strand (11), and the line sensor cameras (35-37) take an image of the POF strand (11) and send the image data to the processing units (41-43). The processing units (41-43) set a detection range, and specify the defect pixels in the obtained image based on the intensity of the image. Then, a blob process is carried out to combine the adjacent defect pixels, and determine the existence of the internal defect and specify the defect type based on the size of the combined defect area.